THE Chemical Age

VOL. LXXIV | 28 APRIL 1956 | No. 1920

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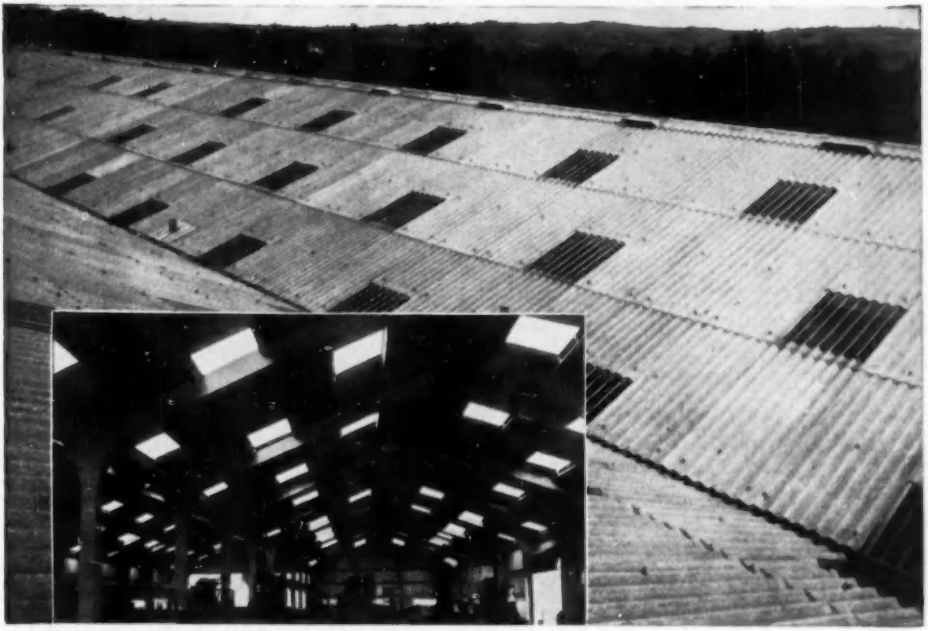

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Editor: *E. Arnold Running* . *Manager:* *H. A. Willmott*

Director: *N. B. Livingstone Wallace*

MIDLANDS OFFICE:
Daimler House, Paradise Street, Birmingham
Phone: Midland 0784/5

SCOTTISH OFFICE:
116, Hope Street, Glasgow, C.2
Phone: Central 3954/5

LEEDS OFFICE:
Martins Bank Chambers Park Row, Leeds, 1
Phone: Leeds 22601

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The Budget, 1956

IN COMMON with most serious publications it has been our custom for some years to comment upon the annual budget; indeed, in these crucial post-war years, budgets have often had a most direct bearing upon the fortunes of technical development. But there are no technical crosslinks of obvious kind in Mr. Macmillan's Budget, and were we strictly guided by the relevant topics of a chemical publication we could this year pass the Budget by without comment. Yet to do so would be narrowly irresponsible, parochially evasive. Few Budgets have been awaited in greater sense of expectancy; the general economic situation of this country has rarely demanded so much decision. But from the whole mountain of speculation that preceded it Mr. Macmillan's Budget emerged last week with the semblance of a mouse. It did not introduce a cavalcade of change, nor did it make particularly drastic changes. It may well prove to be an even more curious paradox as time unfolds, a post-war budget that achieves its aims and restores stability.

Its very lack of sensation makes the Budget highly suspect. With so much action seemingly required, how can so little be effective? Many critics have expressed this kind of doubt and few economists have expressed other than disappointment. When the root cause of our troubles is persistent inflation, when many remedies have been proposed and tried and none has had real success, was a new Chancellor expected to produce certain and complete cure in a single prescription? There was some expectation of this but those who hoped for some sudden 'New Deal' were indulging in wishful thinking. Mr. Macmillan has been cautious; he has deliberately followed a policy of non-provocation. What he has not done has been no less significant than what he has. The last Budget was an emergency 'extra', and even that was followed by a semi-budget review of our finances. Both these attempts to battle with inflation brought their unpalatable doses of medicine for reducing spending pressures. Mr. Macmillan has kept them in operation; at the same time he has given no form of relief that could significantly weaken their effects. Yet there was strong pressure from many quarters for reliefs that would create more incentive for personal work, personal responsibility, etc. The Chancellor has aimed to protect his surplus and to increase public savings; if he succeeds there may be a levelling out of the steady rise in wages and prices.

The new Budget is simple. Time alone can show if it is over-simple. 'Surplus' spending-power can be mopped up by reducing the amount of money, and this can be done either brutally by taking it in more and more taxation or in a more pala-

table way by making it more attractive for spenders to save some of their cash. Mr. Macmillan is backing this latter course. His political opponents would prefer controls on the goods, controls on raw materials, etc., etc. This very different approach may have initial or surface success, but it brings with it other inflationary pressures — swollen pay-rolls for Government control departments, grey-market and even black-market developments to evade or alleviate restrictions, and worst of all a deadening of the competitive force in industry. These delayed effects occurred forcibly before, and for that reason intensive State planning of the country's trading produced checks to inflation that were all too brief. Can the approach by saving do better? Or, more basically, will the new incentives for saving in fact encourage saving? Mr. Macmillan can answer all criticisms by saying, 'Wait and see' although he will not have further opportunities before April of next year to be more experimental *if* these simpler aims have brought an improved situation. Another emergency Budget would ruin both the Conservative Party's chances at the next election and overseas confidence in Britain's economy.

There are moral or ethical objections to the lottery-device he has introduced, but the hard facts of human nature cannot be disguised. This incentive to save will particularly appeal to a section of the community that is at present powerfully occupied in spending. It is a guided missile rather than a fishing-net. Is it in any case more immoral or more unethical than taxing alcohol heavily? Is it more discreditable to a Government than the post-war credit scheme? The saving habit has been eroded. No means of reviving it can be neglected by a realistic Chancellor. And the moral or ethical aspects of life deteriorate sharply and heavily if inflationary pressure ceases to be controllable.

The relief of income tax on the first £15 interest of Post Office Bank or Trustees Bank savings represents another concession to the hard facts of human nature. Nothing discouraged savings of this kind more than the probing of accounts for tax liability. The overdue concessions for self-employed workers who insure against poverty in old age may cost revenue but again this piece of fiscal justice stimulates saving.

Questionable proposals in the Budget are the increases in profits taxation for companies and the decision to provide capital for nationalized industry out of State funds. The latter decision has been described as 'temporary' and for the time being criticism on principle might be postponed; but intentions in budgets are often temporary when in fact they become permanent. The increased rates of tax for profits are small enough, but they follow an increase in rate upon distributed profits introduced only last autumn in Mr. Butler's second 1955 Budget. We can but repeat our views then—that raising this particular form of taxation is at lowest level an accompaniment of Government and other appeals for restraint in wage demands, but it falls as a burden upon all companies alike whether their enterprise sells British goods abroad or places luxury production on the home market. The very small rise in taxation rate on undistributed profits seems a triviality. It could encourage needless spending by small companies—however, it is too small a charge to have notable effects.

Finally, there is the promise (now somewhat budget-worn) to reduce Government expenditure—on this occasion by £100,000,000. If this foreshadows a general cutting policy, falling equally upon old and new State activities, it may be more popular than useful. Technical development expenditure by Government Departments is inadequate still. Also as Government expenditure is temporarily to carry the capital needs of nationalized industries, total economy may be impossible to show. If this promise is taken as a Budget pledge, and there are powerful opinion-groups that will press this point, Mr. Macmillan may regret stating a target figure.

The Budget of 1956 may have been unexpectedly mild and unexpectedly brief but a reaction of surprise is not in itself evidence of error. Time may honour Mr. Macmillan's judgment and disperse the criticisms even though at the moment few people appear to share the Chancellor's optimism.

Notes & Comments

Canadian Pace

THERE is no slackening for Canada's industrial expansion—all that happens is an annual quickening. The latest Government estimate for 1956's industrial expansion, based upon information received from 16,000 firms and representing from 70 to 95 per cent of Canada's major production lines, is that capital investment is 21 per cent up on the 1955 figure. Such an increase in a single year is enormous; it has only been approached in the 1946/47 period when post-war reconstruction and readjustment was naturally creating an abnormal background. Nor is this figure of 21 per cent the complete measure of expansion. When it is divided into sections, quite extraordinary development trends are revealed. The increase in investment for the chemical industry is 74 per cent—and this can again be split into a 48 per cent rise for buildings and a 100 per cent rise for plant. In general, a major proportion of the overall 21 per cent increase in all industrial investment is being devoted to machinery, equipment—in short, to the country's production lines.

Comparisons Invidious

IT is certainly invidious to make comparisons between this Commonwealth situation and our own. Nor perhaps would it be fair, for Canada is at a vastly different stage in her industrial history. The economic tragedy, from our viewpoint, is that this vigorous sector in Commonwealth industry is not within the sterling area. On the other hand, this regrettable fact creates a major dollar-earning opportunity. To quote from the March issue of *Canadian Chemical Processing*: 'For *those who sell chemical processing machinery and equipment* the signals are clear, calling for a tremendous increase in selling efforts to win the maximum share of a market that will double 1955 volume.' The italics are ours. We hope they emphasize the fact that British companies are among 'those who sell chemical processing machinery and equipment'. Will British sales efforts secure a big share in this doubled market? Or will we be content with showing some increase such as 10 or 15 per cent when in fact opportunities have been doubled?

Insuring Atomic Fission

A PROBLEM that is rarely mentioned has recently been discussed in *Chemical Engineering News* (1956, **34,** 1558)—the risk of an explosion at an atomic energy plant. That the risk is small will be generally agreed. That it cannot be completely excluded from reckoning means, however, that it must be classified as an insurable risk. Claims following any such disaster would obviously be enormous, and the view seems to have been reached in America that no insurance company would possess the resources to meet the bill. A pool approach to the problem is being worked out and sums of $50,000,000 in one pool and $15,000,000 in another have been mentioned. However, as is soundly pointed out in *Chemical Engineering News*, such a sum or sums may represent bigger cover than insurance has ever created for a single risk, but there will be many atomic energy plants in operation. At the same time the US Government is considering taking part in 'atomic insurance'—one bill now before Congress would make the Government a partner in shouldering liability provided that the company operating the plant also had privately secured insurance adequate to cover normal probabilities. This seems very much fairer to the man in the street than another Bill which has been put forward—this would limit a company's liability to a sum equal to twice the capital cost of the plant.

Adverse Effect

THE fact that this problem has now come out into the open indicates that it has already had an adverse effect upon atomic energy development. Lack of adequate schemes for insuring against disaster risks has been retarding firms' decisions to develop atomic power. In this country we have not perhaps pro-

ceeded far enough to be looking at the same problem as realistically. Yet it must inevitably be faced.

Low Pressure Polythene at BIF

AFTER weeks of enquiry, in January THE CHEMICAL AGE was able to wrest from Petrochemicals Ltd. the confession that they now had more than one pilot plant at their Partington works engaged in investigations based upon the Karl Ziegler patents. Since then no more has been heard from the firm regarding their plans to make use of their sole UK rights to these patents and their intentions regarding low pressure polythene. At the Shell Chemical Co. Ltd. stand at the British Industries Fair at Olympia this week, however, several samples of low pressure polythene were available for inspection and THE CHEMICAL AGE was told that these samples had been produced on one of these pilot plants. Petrochemicals Ltd. was taken over by Shell Chemical Co. Ltd. some months ago.

Enquiries at the stand of The Distillers Co. Ltd. failed to yield any information regarding the plans of DCL and other interests to obtain the UK rights for the low-pressure polythene process developed by the Phillips Petroleum Co. of the US.

I.Chem.E. Officers

John Oriel Re-Elected President

THE 34th annual corporate meeting of the Institution of Chemical Engineers was held at the May Fair Hotel, London on 24 April with the president, Mr. John A. Oriel, C.B.E., in the chair. The following officers were elected:— *president*: Mr. John A. Oriel (re-elected); *vice-presidents*: Mr. G. U. Hopton; Professor H. L. Roy (re-elected), Mr. P. K. Standring (re-elected), and Mr. A. S. White; *joint honorary secretaries*: Mr. F. E. Warner (re-elected) and Mr. R. C. Odams; *honorary treasurer*: Mr. F. A. Greene (re-elected); *members of Council*: Mr. J. S. Brough, Dr. B. Edgington, Dr. J. F. C. Gartshore, Mr. L. W. J. Loveless and Professor F. Morton. The continuing members of Council are: Mr. H. D. Anderson, Dr. H. W. Ashton, Mr. W. E. Aylwin, Mr. C. G. Bacon, Mr. Keith Fraser, Dr. E. H. T. Hoblyn, M.B.E., Mr. J. P. V. Woollam.

At the close of the meeting, the president presented medals and medal certificates as follows:—

The Moulton Medals.—The Moulton Medal for 1955 for the paper 'The Separation of Organic Mixtures by Crystallization from the Melt', by J. S. Forsyth (Associate Member) and J. T. Wood.

The Junior Moulton Medal for 1955 for the paper 'Some Aspects of the Absorption of Silicon Tetrafluoride Gas in Water by A. L. Whynes (Student).

The William Macnab Medal.—The William Macnab Medal to John Duncan Howie for the best set of answers submitted at the 30th Associate-Membership Examination. The answer submitted by Francois Antoine Hubert Gilissen were highly commended.

At the annual dinner in the evening, attended by 300 members and guests, the toast, 'The Institution of Chemical Engineers' was proposed by Marshal of the Royal Air Force Lord Tedder, Chancellor, The University of Cambridge. Sir John Maud, K.C.B., C.B.E., Permanent Secretary, Ministry of Fuel and Power, responded to the toast to the guests.

At the close of the proceedings, *The Osborne Reynolds Medal* was presented to Mr. F. E. Warner for his services to the Institution, especially as joint honorary secretary.

To Open London Office

At the British Industries Fair it was revealed that Hardman and Holden Limited, the Manchester heavy chemicals firm and makers of Manox products, are opening a sales and service office at 28 Queen's House, Kingsway, London SW1. The office will be under the personal supervision of Mr. John Holden and the telephone number will be CHAncery 8331.

Titanium Tetrachloride

It has been learned that Laporte Chemicals Limited are at the pilot plant stage in their plans to produce titanium tetrachloride. At the moment Peter Spence & Sons Ltd. are believed to be the only firm manufacturing this material.

THE CHEMICAL AGE at the BIF

Telephone numbers of THE CHEMICAL AGE stands at the BIF are:—Castle Bromwich, stand A427 (Fair 213); Olympia, stand A16 (FULham 7622).

THE RIDEAL RESEARCH LABORATORIES NEWPORT

NEW research laboratories, named The Rideal Laboratories in honour of Professor Sir Eric Rideal, were officially opened by Sir Cyril Hinshelwood, Dr. Lee's Professor of Chemistry at Oxford and President of the Royal Society, on 17 April. The laboratories, situated at the Newport, Monmouth, factory of Monsanto Chemicals Limited, are said to be the first in Great Britain to make use of sub-atomic particles for peaceful industrial research.

Following the opening, which was attended by many of Britain's most distinguished scientists, Sir Eric Rideal delivered a dedicatory address entitled 'On the Opening of a New Laboratory'. Sir Eric, late professor of physical chemistry at King's College, London, is consultant to, and until recently was a director of, Monsanto Chemicals.

The Rideal Laboratories were designed to provide Monsanto with further facilities for physical, chemical and engineering research, particularly in the polymer field. Primary functions will be to seek means of improving products and manufacturing processes and, by developing new products, to diversify operations both at Newport and the company's other factories. Extensive research facilities are already located at the Nickell Laboratories, Ruabon, and Fulmer Hall, Buckinghamshire.

In addition to the conventional research facilities which include a section for pilot plant work, there is a specially equipped laboratory for the study of chemical and physical changes arising from nuclear radiation.

The chemical and chemical engineering laboratories are located in a two-storey brick building of attractive design. Two chemical laboratories are provided, one on each storey, and each has direct access to the chemical engineering area which occupies the remainder of the main building. The ground floor laboratory will be engaged chiefly in research concerned with improvements to existing Newport products and manufacturing processes. The first floor laboratory will be used for longer term research in the organic and physical chemical fields. The job of the chemical engineering research laboratory will be to solve the problems which arise in the developing of a new product or a new manufacturing method. A physical-analytical research laboratory is at the moment housed in an old building some distance from The Rideal Laboratories but it will be moved in due course as there is ample room for expansion.

The gas chromatograph in the physical-analytical laboratory

A physics laboratory, rheological laboratory, polymer technology laboratory and precision workshop are all housed in the new main building. The physics laboratory contains facilities for experimental work covering the fields of dynamic polymer testing, osmometry, viscometry and electronic studies. The rheological laboratory is equipped to measure the important physical and mechanical properties of polymers in solid and latex form.

The equipment in the chemical, chemical engineering, physics and technological laboratories is of the very latest type. It includes a Grubb-Parsons infra-red spectrograph, a Hilger ultra-violet spectroscope, a vapour phase chromatograph, a recording torsion pendulum and its associated electronic equipment, a Sjostrand ultra-microtome, an Instron tensile testing machine, impact testing equipment, an electron microscope and carbon evaporation equipment.

The most interesting section of the Rideal Laboratories is the radiation laboratory which is designed primarily to permit study of the effect of γ-radiation on materials such as plastics and also to use the radiation for promoting chemical reactions. In addition, the facilities should permit the use of small β sources for similar types of studies.

The initial design provides for work with two separate 100 curie cobalt 60 sources, but small modifications should enable studies to be made with up to 500 curies of this isotope and 1,000 curies of caesium 137.

Certain hazards are involved when working with these fairly high levels of activity. Adequate safety precautions have been incorporated in the design but it has been deemed advisable to limit the number of personnel entering the laboratory by constructing it in a building separate from the company's main research laboratories.

In designing the facilities, the maximum permissible level of radiation to which research workers will be exposed has been taken as 0.3 rads/40 hrs. (=1 tolerance) as recommended by the International Commission on Radiological Protection.

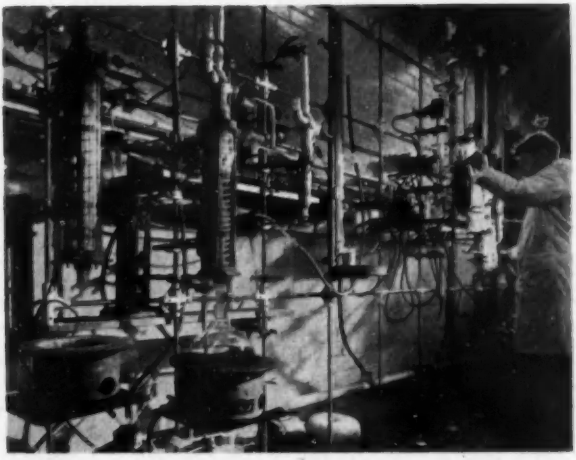
In order to reduce the level of activity in the laboratory proper to below 1 tolerance, it is necessary to have at least 42 in. of dense concrete around a 100 curie cobalt 60 source on any direct line to the outside of the shielding. At Newport a greater thickness is used.

Briefly, the shield consists of a large cube of concrete, in the centre of which the source is situated when it is not in use. The source itself is contained in a metal cylinder about 1 in. diameter by 5 in. long and is attached to a flexible steel cable running in a tube which emerges at the front of the cube. On the front face of the shield are controls which enable the source to be driven mechanically into the working space, which is located at the back of the concrete cube.

Working Space

Within the working space experimental apparatus is set up, and the experiment is commenced when the source is driven forward into the working space. The working space itself must therefore be shielded from the laboratory proper by further concrete walls, and access to it is obtained through a short passage in the shielding. This passage is terminated by a steel gate.

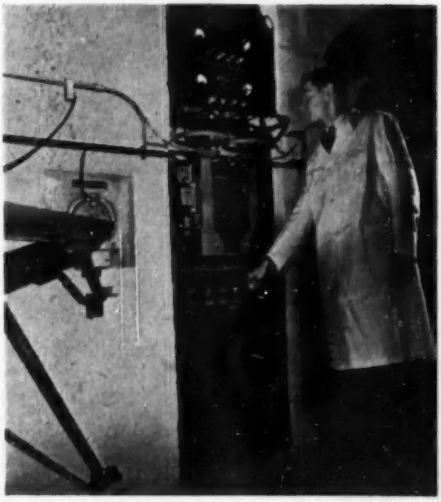
Provision has been made to install sources of various dimensions and source-drive mechanisms of various standard designs. Mirrors permit observation of the working space from the gate (which is closed and locked when the source is in use) and service ducts have been provided for bringing such items as thermocouple leads, or remote



Complex assemblies such as this distillation apparatus and continuous reactor, are set up on special grids with full services and are for use in process research

pressure indicators, to the front surface of the concrete cube.

In addition, the alternative-access plugs enable the source to be used for certain purposes when it is in its rest position at the cube centre. This can be useful if elaborate equipment is being set up in one of the working spaces, since it enables full use to be made of the sources at all times.



The radiation source being driven forward. The electric motor driving the source is controlled from the cabinet at the bottom of the cavity and can only be operated when the various relays of the interlock system are correctly positioned

The design of the source-drive mechanism incorporates both mechanical and electrical interlock mechanisms which ensure that the gate into the working space must be locked shut and the same key inserted into the driving mechanism before the source can be driven into the working space. The total length of source travel is also controlled by electrical relays. It is the duty of the source operator to inspect the working space before locking the gate, to ensure that no-one remains inside. The operation of closing the gate extinguishes the light in the working space and when the source is driven forward a loud bell rings. Thus, in the unlikely event of someone being left in the working space when an experiment is to begin, adequate warning is given.

Continuous check on exposure of staff to nuclear radiations is provided by the conventional film badge service. For occasional exposure to higher levels of activity than those experienced in the laboratory proper, quartz fibre electrometers are available, giving an immediate measure of the dose received.

All persons entering the working space at any time carry a hand monitor which gives a continuous and sensitive measurement of dose rate.

These measures in themselves are quite adequate, but further protection is provided by a continuous automatic monitor in the working space which comes into use only when the gate is opened. This monitor rings a loud bell if the radiation level is above 20 tolerances in the working space and has been

provided primarily to cover the possibility of the source becoming detached from its flexible cable and remaining in the working space when the cable is in fact retracted.

The real hazard from a fire in the working space lies in the possibility of mechanical damage to the source with subsequent release of activity (i.e. 'contamination'). The working spaces have therefore been fitted with an automatic carbon dioxide extinguishing system operated by fusible links and capable of being operated manually from the outside of the shielding.

Two distant types of study are to be made in the radiation laboratory although in a given experiment both effects are often present together and have to be separated or allowed for.

It is now well known that γ-radiation can bring about interesting and sometimes valuable changes in the properties of materials. These changes have been particularly suited in the field of plastics, and as new plastics materials come forward they will be examined under the influence of radiation. The effects produced show the value of the sample as a structural material in high intensity radiation fields, and it is sometimes found that specifically valuable properties may be produced.

Radiation can often be used to replace heat, light or catalysts in promoting the chemical reactions which are the basis of a chemical industry's operations.

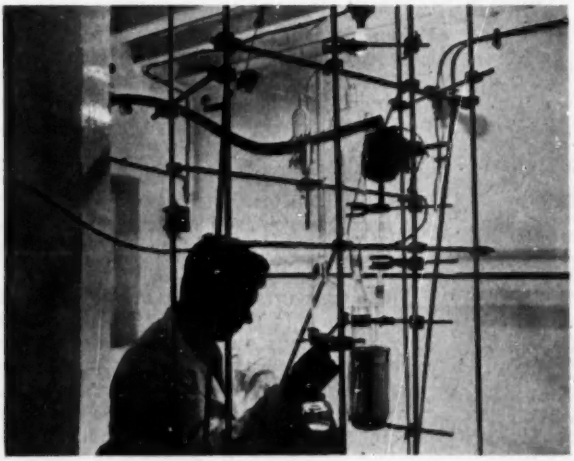
In order that the use of radiation shall be an economical proposition for such purposes it

When the cobalt 60 source in the radiation laboratory is in the working area, visual observations can be made from outside the radiation shield by means of a series of mirrors and a telescope

appears that one of the following conditions must be met:—

(1) A large amount of chemical reaction must be accomplished per unit of γ-radiation absorbed by the system.

continued on page 948



Equipment used in the study of a gas phase reaction under the influence of gamma radiation from the cobalt 60 source. The source tube can be seen passing through the annular reaction vessel

A New Uraniferous Rare Earth Mineral

by N. R. SRINIVASAN, Ph.D., M.Sc., M.I.I.M.

THE occurrence of a new rare earth mineral containing uranium from the Mary Kathleen lease in the Mount Isa district of Queensland, Australia, has recently been announced. It has been named stillwellite in honour of Dr. F. L. Stillwell, formerly chief of the mineragraphic section of the Commonwealth Scientific and Industrial Research Organization, Melbourne, who has made notable contributions in his field. It might perhaps be interesting to recall that this is the second instance of a new uraniferous mineral being discovered in Australia, the first one named davidite having been discovered years back in Radium Hill in South Australia.

Radioactive Ore

The radioactive ore containing stillwellite is dark brownish-grey with an ill-defined porphyroblastic texture, consisting of brown to cream crystals in a darker, somewhat lustrous ground mass. It is distinctive from the allanite ore. However, some radioactive drill-core specimens which are closely similar to the stillwellite-rich rock consist essentially of garnet with some allanite and apatite. In thin section stillwellite is colourless with a birefringence of 0.119 ± 0.002. Thick sections and grains are pale-brown and non-pleochroic in transmitted light.

Measured in immersion oils the refractive index of the ordinary ray, N_o, shows a variation from 1.760 ± 0.002 to 1.784 ± 0.002 for sodium light. Occasional zonal variation of refractive index within crystals is evident in thin sections. As discussed below this variation in refractive index does not imply a variation in chemical composition, and may arise from varying slight disruption of the crystal structure towards the metamict state. A difficult prismatic cleavage parallel to (0110) gives rise to tabular fragments when stillwellite is crushed. The scratch hardness is 5½ on Mohs' scale and the density determined with a micropyknometer is 4.57 ± 0.10 gm/cc.

Pyrognostic tests reveal that a small amount of water is evolved from stillwellite when heated in a closed tube. Heating with sodium carbonate on a charcoal block produces a strongly incandescent globule which turns blue with cobalt nitrate. The borax bead is coloured yellow when hot, pale-yellow when cold, and the microcosmic salt head is pale-blue from the oxidizing flame and colourless and translucent from the reducing flame. The greenish-yellow colour imparted to a flame, which is green when viewed through a Merwin screen, arises from the boron.

A concentrate of stillwellite was prepared from a -100 $+200$ mesh fraction of the specimens with a Franz isodynamic magnetic separator followed by centrifuging at 1,800 rpm in Clerici solution of density 4.2 gm. per cc. Microscopic counting of 820 grains reveals that the concentrate contains 98.5 ± 0.4 per cent stillwellite with visible inclusions of uranite and 1.5 ± 0.4 per cent phosphate. The chemical analysis of this concentrate is given in the table. The 0.61 per cent of U_3O_8 corresponds to 0.6 per cent of uranite, and the concentrate thus contains 97.9 ± 0.4 per cent stillwellite.

The analysis reveals that the major constituents of stillwellite are lanthanous silicon, boron, and oxygen. Calcium and phosphorus are minor constituents being present in the concentrate in excess of the amounts required in the 1.5 per cent of apatite. The 0.95 per cent of water represented by the loss on ignition is not essential to the crystal structure of the stillwellite which is not destroyed or disrupted by the ignition.

TABLE

Preliminary Analysis of Stillwellite

Constituent	*Percentage* (Dried at 110°C)
SiO_2	20.1
B_2O_3	11.5
*La_2O_3	58.4
P_2O_5	2.58
U_3O_8	0.61
Fe_2O_3	0.23
Al_2O_3, etc.	1.68
CaO	3.96
CO_2	0.18
F	0.16
Ignition loss	0.90
	100.3

** Ce_2O_3 is 51 per cent of total La_2O_3 and heavy lanthanous ore not greater than 5 per cent of total La_2O_3.*

The crystallography of a blade-shaped fragment of stillwellite was determined by X-ray single-crystal Laue rotation and Weissenberg photographs. The Weissenberg

photographs for rotation about the *c* axis reveal that stillwellite belongs to the hexagonal crystal system and is of a space group, specified by the standard international Herman-Mauguin symbols C3m or $C3_n2$. The hexagonal unit cell is of dimensions a = 6.85A° c = 6.64A°, and the axial ratio c:a is 0.969.

For the measured density of 4.57 ± 0.10 gm/cc. this unit cell contains $3(LaO_{0\cdot23}$ $CaO_{0\cdot14})$ $B_{0\cdot86}$ $(Si_{0\cdot89}P_{0\cdot09})$ $(O_{4\cdot39})$ $(OH_{0\cdot26})$. Grouping together the cations which commonly show mutual substitutions, this corresponds closely to a structural formula (La, Ca) B(Si, P) $(O, OH)_5$, with three such formulæ in the unit cell. The boron content revealed by the analysis is slightly below that required by this structural formula.

The X-ray powder pattern of stillwellite shows diffuseness of lines in the back diffraction region, but after ignition the stillwellite gives an X-ray powder pattern in which the lines are sharp throughout. The birefringence of the ignited product is 0.020 ± 0.002, and the refractive index N_0 is 1.784 ± 0.002 in sodium light with an absence of the lower refractive indices present in the untreated stillwellite.

This behaviour on heating is similar to that known for other minerals which have a small number of radioactive atoms within the crystal structure, and reveals the first stage of partial disruption of the crystal structure towards the metamict state. Such disruption leads to the lowering of refractive index, diffuseness of X-ray back diffractions, and is associated with the presence of some H_2O in the mineral. On ignition the mineral reconstitutes to its normal state.

These properties may vary within a single crystal with variation in the amount of the disruption. In view of its response to ignition, the variation in optical properties of stillwellite is ascribed to this phenomena. The small content of water which is present in the natural mineral and absent from the fully crystalline stillwellite produced by ignition is probably associated with this slight disruption. The areas of weak radioactivity recorded on auto-radiographs of long exposure accord with this interpretation. However, substantially all the U_3O_8 in the analysis corresponds to the visible uraninite.

Stillwellite may be compared with the rare-earth silicate mineral cerite, and the rare-earth borosilicate mineral, melanocerite. Stillwellite has a slightly lower refractive index than cerite, from which it is distinguished and established as a separate mineral by its different X-ray powder pattern. Chemically it differs from cerite by the presence of boron. The rare-earth borosilicate melanocerite is distinguished from stillwellite by having lower refractive indices and being optically negative in contrast to stillwellite, which is optically positive. Stillwellite differs chemically from melanocerite by having a higher silicon and boron content.

It should perhaps be concluded that intense activity is going on in Australia in the search for and the processing of uranium minerals with the help of United Kingdom scientists. An airborne scintillograph survey of Victoria designed to locate areas of increased radioactivity has just been conducted, besides similar surveys in other States. The processing of the ore at Rum Jungle (NT) is going on according to schedule and an interesting process for the 'acid pressure leaching' of uranium ores has been perfected at the Division of Industrial Chemistry of the CSIRO, Melbourne, the details of which are just available.

The Rideal Laboratories

continued from page 946

(2) A product must be produced with some 'special' properties compared with that produced in the reaction as normally carried out

(3) A material must be produced which could not normally be obtained at all (e.g. because of its thermal instability).

The field of plastics, in which Monsanto is already a substantial manufacturer, appears at present to offer uses for γ-radiation under at least two of these headings.

Although the programmes of work put considerable emphasis on the production of plastics with new and interesting properties, prepared by use of γ-radiation, Monsanto are also interested in making use of the energy for a wide variety of other reactions. These include alkylations, halogenations, oxidations and isomerizations.

'In the present state of knowledge in the field of radiation chemistry', states the company, 'it is felt desirable to examine as wide a range of reactions as possible, for it is not yet possible to predict just exactly what reactions may occur, nor what properties a given product may have. In particular, the yield of reaction product per unit of radiation absorbed is still a factor which can only be determined by experiment.'

118th Annual Meeting

British Association Goes to Sheffield

PRESIDENT of the 118th Annual Meeting of the British Association for the Advancement of Science to be held in Sheffield from 29 August to 5 September will be Sir Raymond Priestley, M.C. The presidential Address which he will give in the City Hall on the opening day will be entitled 'Twentieth Century Man Against Antarctica.'

During the meeting there will be two public lectures and two evening discourses in the City Hall. The first lecture will be on 30 August when Sir Raymond Priestley will discuss 'Antarctic Adventure' followed on 4 September by Sir John Cockcroft who will speak on 'The Future Development of Atomic Energy.'

The first evening discourse will be on 31 August when Professor F. G. Young and Sir William Dunn will speak on 'The Growth of Biochemistry.' The title of the second discourse is to be announced later.

In conjunction with the meeting Mr. Stanley Moffet, M.C., the director of education in Sheffield, is arranging a 'Science in Schools' exhibition. There will also be a daily screening of scientific films, each session lasting about three hours, in the lecture theatre of the Central Library.

ICI Essay Prizes

Imperial Chemical Industries Ltd., who publish the quarterly scientific review *Endeavour*, have donated 100 guineas to be awarded for scientific essays. Five prizes will be awarded: a first prize of 50 guineas, a second prize of 25 guineas, and a third prize of 15 guineas for competitors whose 25th birthday falls on or after 1 June 1956. Two five guinea prizes will be awarded to competitors who have not passed their 18th birthday on 1 June 1956.

The subjects chosen for the competition are: 'Research in Polar Regions'; 'Scientific Aids to Archaeology'; 'The Story of Steel-Making'; 'The Chemistry of Big Molecules'; 'New Elementary Particles'; and 'The Control of Plant Diseases'. Particulars of the competition can be obtained from the secretary of the British Association at Burlington House, Piccadilly, London W1.

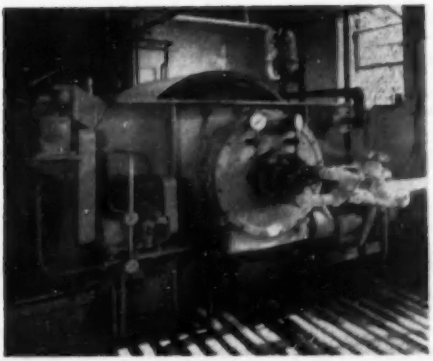
The choice of Sheffield for this year's annual meeting is appropriate, for it is the centenary of Bessemer's announcement of his discovery which was to revolutionize steel production, to the British Association in Cheltenham 100 years ago.

Marmite Problem Solved

TWO precoat filters manufactured by Eimco (Great Britain) Ltd. have been installed by Marmite Ltd. and are reported to have overcome the problem of filtering the yeast liquor for producing Marmite. Previously the liquor was treated in plate and frame filter presses, which, although slow, was the only process that would deal with the yeast extract liquor, which is an intermediary in the manufacture of Marmite. The purpose of the filtering is to remove colloidal solids present in very low concentration in order to give a star-bright liquor. Several other types of filter, including a centrifuge, were tried but failed to deal with the problem.

The Eimco installation comprises two identical filters, each four feet diameter by four feet face giving a total of 50 sq. ft. of filtering area per machine. The filters are constructed in mild steel which is Lithcote covered in all places likely to come in contact with the liquor. The internal piping of the drum is stainless steel.

The plant is claimed to have exceeded its design capacity by roughly 50 per cent. Its layout was a joint undertaking by Marmite Ltd. and Eimco (Great Britain) Ltd. and the control panel was constructed by Marmite Ltd.



One of the two Eimco precoat filters installed at the Marmite factory

Rheologists Symposium

A SYMPOSIUM on 'Research in the Textile Industry' will be held by the British Society of Rheologists on 7 and 8 June at the British Rayon Research Association's Heald Green laboratories at Wythenshawe, Manchester.

The symposium, which will begin each day at 9.30 a.m., will comprise the following programme: Thursday:—opening ceremony by Mr. J. Wilson, director of research of BRRA; 'The Rheological Requirements of Textile Printing Pastes' by Mr. W. G. Harland; 'Moisture & Fibre Structure' by Dr. R. Meredith; 'The Submicroscopic Structure of Drawn Yarns of 6.6 Nylon' by Mr. M. F. Culpin & Dr. K. W. Kemp; 'The Effect of Treatment in Aqueous Phenol Solutions on the Physical Properties of Secondary Cellulose Acetate Filaments' by Mr. R. Jefferies and Mr. H. J. Wellard; and a discussion of spontaneous extension in secondary cellulose acetate.

The programme for Friday will be:—'Nylon Fabrics' by Miss A. M. Thomas and Dr. P. Hatfield; 'Relaxation Phenonema in Weaving' by Mr. K. Greenwood; and an outline of the work of the British Rayon Research Association by Dr. L. R. G. Treloar.

High Speed Photography

MORE than 40 papers dealing with the technique and applications of high speed photography will be presented at the Third International Congress on High Speed Photography which is to be held in Government Offices, Horseguards Avenue, London, from 10-15 September.

The subjects covered will include inertialess shutters, flash light sources, mechanical-optical drum cameras, image-sampling techniques and interferometric, stereoscopic and colour photography.

Many of the techniques and applications featured in the congress will be demonstrated at an international exhibition which will be held in the congress building. A number of films dealing with high speed photography will also be shown. Admission to the exhibition is free; tickets can be obtained by post from the secretariat.

The membership fee for the congress is £6 10s covering attendance at all sessions and the exhibition, and preprints of the conference papers.

Further information is obtainable from the congress secretariat, 3rd International Congress on High-Speed Photography, DSIR, Charles House, 5-11 Regent Street, London SW1.

Orders for Sinter Plants

HUNTINGTON, Heberlein & Co. Ltd., a company of the Simon Engineering Group, reports that since the beginning of 1955 it has received orders, directly or through main contractors, for nine Dwight-Lloyd continuous sintering plants and associated equipment in Britain and three overseas countries.

These nine plants will have an aggregate capacity of 14,600 tons of sinter per day. They comprise three in Britain for Barrow Ironworks, Dorman Long and the Consett Iron Company; one in South Africa for ISCOR; three in France and the French Union for Le Nickel, De Wendel and Société Métallurgique de Normandie; and two in Belgium for Cockerill-Ougrée and Forges de la Providence. Most of the export contracts were secured against keen competition, especially from Germany.

Most of the material, apart from highly specialized equipment, for the French and Belgian plants will be manufactured on the Continent to engineering designs and technical know-how provided by Huntington, Heberlein.

ABCM Forms New Committee

AT THE annual general meeting last October of the Association of British Chemical Manufacturers it was announced that following the DSIR's report of the Cremer Committee on chemical engineering research it was intended to form a chemical engineering research and advisory service committee. This has been formed and a committee under the chairmanship of Mr. E. W Greensmith of ICI Ltd., is now operating.

ABCM members on the committee are:—Dr. J. W. Barrett of Monsanto Chemicals Ltd.; Mr. F. Mackley of Shell Chemical Co.; Mr. K. Piercey of Albright & Wilson Ltd.; Dr. Roffey of the Distillers Co.; and Mr. B. E. A. Vigers of Laporte Chemicals Ltd. The British Chemical Plant Manufacturers' Association have appointed Mr. G. A. Dummett of APV Co. Ltd., the chairman of the Association's research committee, to represent them on the committee.

Properties of Furoic Acid

Technical Data Compiled by Howard Lloyd Chemist

TECHNICAL data on furoic acid has been compiled by Dr. H. A. Fisher, chief chemist, Howard Lloyd & Co. Ltd., Batley, Yorkshire, who claim to be the first company to manufacture this chemical on a commercial scale in this country (see THE CHEMICAL AGE, 1956, **74**, 595).

	PURE GRADE
Molecular Weight	112.08
Physical State	Crystalline solid
Colour	White
Odour	None
Melting Point	132°C—133°C
Dissociation Constant	$K_1 = 7.1 \times 10^{-4}$

Furoic Acid is a relatively strong organic acid.

Vapour Pressure

Temperature (°C)	Vapour Pressure (mm. Hg)
96	1.8
105	3.1
118	7.1
127	12.5
133	17.8
139	26.0

Solubility in Water

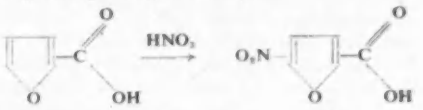
Temperature (°C)	Solubility g/100g water
20	3.6
30	5.8
40	12.4
50	27.0
60	60.0
70	133.0
80	335.0

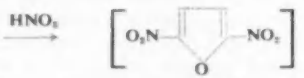
The solubility of furoic acid in aqueous alkalis is very high being proportional to the concentration of alkali.

Furoic acid is miscible with alcohol and ether and appreciably soluble in benzene, chlorinated hydrocarbons, and a great many other organic solvents. It is extremely stable under normal conditions; it does not discolour upon standing or under the action of light. In solution the acid is also highly stable particularly so in alkaline solution but rather less in acid. There is some tendency to decarboxylation at high temperatures but this does not occur to any appreciable extent below the melting point. The sodium, potassium and copper salts are all water soluble; lead furoate is soluble only in hot water.

In general, furoic acid may be said to have properties falling into three groups. Primarily it is an organic acid and has all the usual properties of such an acid. It can readily be converted into the acid chloride, amide, substituted amides and a whole range of esters.

Associated with the aromatic type furan ring are a series of secondary properties including substitutions. Furoic acid may be nitrated and sulphonated directly giving 5-nitro and 5-sulpho-furoic acids respectively, although a certain amount of care must be exercised to avoid replacing the carboxyl group or splitting the ring.

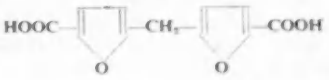




Protection of the carboxyl group by esterification although not strictly necessary makes it easier to avoid these side reactions.

Other aromatic type reactions which may be carried out on the acid or its esters include those of the Friedel-Crafts type producing useful alkyl or acyl derivatives, substitution occurring in the 5 position.

Chloromethylation may also be carried out, to yield 5-chloromethyl furoic acid and under other conditions the following compounds.



Finally a series of reactions more specific to the furan ring are encountered. These are generally largely suppressed by the carboxyl group. The ring is very much more stable than usual, only extreme acid or oxidizing conditions will affect it and addition reactions are not of great importance.

However, if the reaction conditions and procedure are correctly selected all the potentialities of the furan ring may be realized and a series of cyclic or straight chain compounds may be prepared, with substituents in various positions if desired.

Sulphur Firm's Expansion

Pan American's Annual Report

THE annual report of Pan American Sulphur Co., which operates the Mexican Sulphur deposits, shows that shipments during 1955 were approximately 138,000 metric tons. In addition to sales within the Republic of Mexico, movements were made to various countries of Europe (including England), South America, the US, South Africa and Australia.

Production during the year conformed with the company's schedules. Peak production was reached during December, in which more than 64,000 long tons were produced. (January, 1956, production exceeded the previous month by more than 2,000 long tons.) On the basis of present daily production, the company's Jaltipan plant should exceed estimated annual output by a considerable margin, states the report. Including the testing period of late 1954 and early 1955, the company had produced a total of 423,000 long tons at 31 December, 1955, and reached a figure of 500,000 tons on 6 February, 1956.

In August 1955, the directors authorized an expansion programme of 50 per cent which, when completed in August, 1956, will ensure a daily water capacity of the Jaltipan plant in excess of 5,000,000 gallons. Present facilities will handle approximately 3,300,000 gallons daily. This addition of water capacity, together with present input, should ensure a production capacity increase of more than 50 per cent, or total production in excess of 1,000,000 tons annually.

Mexican Demand Grows

The annual report states that an expansion of present facilities was desirable for the following reasons: (1) increasing sulphur demands in Mexico, (2) increasing world-wide demands for Frasch sulphur, and (3) protection of the company's customers under term contracts. Total expansion costs will be approximately $1,500,000. All equipment and materials necessary for this project have been on order for some time and no delay is anticipated.

Based on past experience, it is estimated that within five years world-wide requirements for Frasch sulphur will have increased by approximately 1,000,000 tons, annually. Through the company's added production capacity, it is expected that it will furnish its proportionate part of the expanded demand.

According to the report, sales commitments for 1956 are satisfactory and continue to improve. Present estimated shipments for 1956 exceed 400,000 tons.

Montecatini's Progress

Increased Production in All Fields

NET profit made by Montecatini (Società Generale per l'Industria Mineraria e Chimica of Italy) for the year ending 31 December 1955 was Lit.10,178,846,649 as against Lit.8,640,669,225 for 1954. (The present exchange rate is Lit.1,750 = £1). This was announced at the annual general meeting held in Milan on 29 March. A dividend of Lit.115 per share of Lit.1,000 nominal value was proposed.

The report outlines the company's contribution to Italy's economic progress during 1955. It emphasizes the need for stepping up the pace of industrialization in the depressed area of southern Italy.

Rises in the production of pyrites, bauxite, pitch blende, galena, aluminium, lead and zinc are reported.

Satisfactory developments are reported in those sections of the chemical industry which are traditionally the concern of Montecatini: sulphuric acid, phosphatic manures, nitrogen (fertilizers and industrial uses), chemicals for industry, fungicides, insecticides, lacquers and pharmaceutical products. A number of new plants for the production of compound fertilizers went into production in various parts of Italy in 1955.

A distinct increase is reported for plastics production with particular importance attached to Fertene, Rotene, Vipla, and the new fibre Movil. The output of super-polyamide fibres rose and production began of a new synthetic fibre, Terital.

During 1955 Montecatini secured orders for 43 plants in 12 different countries.

The company's labour force increased during the year and expenditure on wages rose from Lit.39,400,000,000 in 1954 to Lit.41,200,000,000 in 1955.

At a board meeting after the annual general meeting Ing. Giuseppe Mazzini was relieved at his own request of the post of president which he has held since 1948. Dr. Carlo Faina, who continues as managing director, was appointed president.

HOME

Scholarship Endowed

Mr. F. Ellison, a Bradford business man, has donated £5,000 to endow a scholarship in chemistry or chemical engineering at Bradford Technical College. Mr. Ellison once studied chemistry at the college.

To Close Down

Gray & Taylor Ltd., fertilizer manufacturers, of Dalkeith, is to close down. Absorbed by Scottish Agricultural Industries Ltd. in 1944, it continued to trade under its old name, but SAI have decided now there is no point in maintaining two depots at Leith and Dalkeith.

Corrosion Group Visit

The Corrosion Group of the Society of Chemical Industry will visit the research station of the British Petroleum Co. Ltd. at Sunbury-on-Thames on 16 May at 2.30 p.m.

BP's Film Show

More than 14,000 stockholders, company guests and staff attended the British Petroleum Company's London showing of its latest documentary films on 25 April. Eight major cinemas were booked for the morning so that audiences could see the programmes simultaneously.

Fairy Dyes Seek Future In London

Following their loss of £24,034 last year, Fairy Dyes Ltd. of Glasgow, are to move to London. This was announced by Mr. Fred Shoesmith, the chairman and managing director, who at the annual meeting on 16 April said he had voluntarily cut his salary by 40 per cent six months earlier, and had waived directors' fees in the current year. The company has sold its property in Glasgow and all debts and overdraft have been paid in full.

£25,000 Gift

A second gift of £25,000 has been given to University College, Oxford, by Mr. James George Weir, of G. & J. Weir Ltd., Holm Foundry, Cathcart, Glasgow, in memory of his son Colin Weir, a former member of the college, for a fellowship in one of the physical or biological sciences. The first gift, presented in 1954, was also in memory of his son for a fellowship for the study of politics with special reference to international affairs.

Works Tour

The London branch of the Institute of Metal Finishing will make a works visit and a river trip to the Ford Motor Co. Ltd., at Dagenham, Essex, Tuesday, 29 May. The party will leave Charing Cross Pier at 11 a.m.

Acheson Plant in Netherlands

Acheson Colloids Ltd., of London, manufacturers of 'dag' dispersions have formed a new company, Acheson Colloiden NV, in Rotterdam. The factory, now being built at Scheemda in the province of Groningen, will be completed in the autumn. Acheson's Plymouth works and the London office will provide key personnel.

Output of Geon pvc Up

Extensions to British Geon's factory at Barry, which have recently been completed, have raised the productive capacity for Geon pvc to 27,000 tons per year. When the factory was built in 1948 output was 6,000 tons per year.

Increased Gas Coke Prices

Because of the five per cent increase in rail charges and increasing distribution costs, gas coke prices were increased on 23 April. The schedule, per ton ex-works, of the area gas boards is:—Northern (10d); North Western (1s 8d); North Eastern (1s 3d); East Midlands (1s 8d); West Midlands (10d); Eastern (3s 4d); North Thames (2s); South Eastern (2s); Southern (2s 6d); South Western (3s 4d); Scottish (1s 8d), with the exception of counties of Renfrew, Lanark, Dumbarton, and the cities of Glasgow, Edinburgh and Dundee.

The Adventurous Years

An interesting film—'Alkathene—The Adventurous Years' was given its first showing by Imperial Chemical Industries Ltd., Plastics Division, on 16 April at the Savoy Hotel, London. The film shows the history of the development of polythene and was well received by a large audience consisting of users of polythene moulding materials, the representatives of firms which manufacture polythene under licence to ICI, representatives of firms which make plastics other than polythene, a number of people interested in the making of industrial films etc. The film is available for showing and copies can be borrowed from ICI's film library.

OVERSEAS

Hydrogen Peroxide Plant

Mr. H. Greville Smith, president of Canadian Industries Ltd., announced at the company's recent annual general meeting in Montreal that a hydrogen peroxide plant will be built at Hamilton, Ontario. When completed, the plant will utilize an improved electrolytic process.

Lung Cancer Drug

A new drug similar to mustard gas has shown promise in the treatment of Hodgkin's disease and other forms of lymphatic cancer it was announced at San Francisco on 22 April. Two University of California scientists have found that this drug also appears to have beneficial effects in certain patients with lung cancer. Final clinical evaluation must await more extensive use on patients, a society spokesman said.

Saudi-Arabian Oil

Crude oil production in Saudi Arabia during March amounted to 31,278,000 barrels, or a daily average of 1,009,000 barrels.

Nitrate Agreement

An agreement between Anglo-Lautaro Nitrate Corporation and the Chilean Government increases to 40 per cent from 25 per cent the Government's participation in the industry's profits. The agreement also provides a guarantee against discriminatory foreign exchange rates which have burdened the industry in the past, and otherwise improves operating conditions for the company.

Coal Gasification Plant

The first big coal gasification plant in Western Germany has been put into operation at Dorsten. The long-flame gas coal, of which about 335,000,000 tons a year will be used, is being gasified under high pressure with the assistance of oxygen. Daily output will be around 1,400,000 cubic metres, and the gas will be mixed with natural gas to bring it up to the 4,300 calories standard of the type normally used.

Israel's Expanding Glass Industry

Israel's $4,000,000 glass industry in Haifa, which uses local quartz sand from the Negev desert, has stepped-up production to 25,000,000 sq. ft. per year. Last year the plant received orders for $500,000 of window and crystal glass from the US. In 1954 the total dollar sales were valued at $150,000.

Burma Pharmaceutical Industry

Recent visitors to the Burma Pharmaceutical Industry in Rangoon included Mr. A. Mikoyan, Deputy Premier of the USSR, Sir Hubert Rance, a former Governor-General of Burma, and Mr. Dag Hammarskjold, Secretary-General of United Nations. It is reported that when Mr. Mikoyan was asked to sign the visitors' book he wrote nearly a page in Russian congratulating everyone concerned on doing a noble job of work!

Canadian Aluminium

Canadian aluminium production in 1954 is placed at 560,880 tons against 1,460,565 for the US and 305,000 for Russia.

Peracetic Acid Project

Plans for a plant to produce between 25,000,000 and 50,000,000 lb. of peracetic acid a year have been drawn up by Union Carbide and Carbon Corporation. The starting material is acetaldehyde from which acetic acid is also made. The company say they can produce both materials by the same process without any diminution in the supply of acetic acid. Peracetic acid is expected to find applications in the fields of germ killers, textile bleaches, perfumes and plastics, particularly epoxy resins.

New Unit For Lavera Refinery

A new distillation unit is to be built at Lavera refinery, near Marseilles, which is operated by BP's French associate, Societe Francaise des Petroles BP. Since the war, the capacity of Lavera has been raised from 550,000 tons a year to 2,200,000 tons. The new distillation unit will increase the capacity of the refinery to 3,000,000 tons initially.

BP's Bitumen Expansion

The new bitumen plant at BP's Kwinana refinery, Western Australia, has produced over 12,500 tons of bitumen since it was commissioned in July last year. The bulk has been used for the construction of new roads and the repair of existing roads in Western Australia during the current road-making season. Specially insulated bulk tanks have been constructed so that bitumen can be delivered from Kwinana to the road site in a hot and liquid state. On one journey, motor trucks equipped with such tanks were able to deliver bitumen to a site some 250 miles away without loss of heat in transit.

PERSONAL

MR. J. M. SIMS has been appointed a director of Thomas Hedley & Co. as from 1 May.

MR. R. F. BISHOP, M.A., A.M.I.Mech.E., has been appointed chief engineer (special developments) and MR. D. S. HUDSPETH, B.Sc. (Eng.), A.M.I.C.E., has been appointed chief engineer (petroleum equipment) of Whessoe Ltd.

MAJOR W. R. BROWN, D.S.O., has been elected vice-chairman of The Power-Gas Corporation Ltd. and MR. T. K. HARGREAVES, D.S.O., M.A., A.M.I.Mech.E., has been appointed a director of the company. Major Brown joined the firm in 1928 to take over its blast furnace business. He was appointed to the board of its associated company, Ashmore, Benson, Pease & Co. Ltd. in 1942 and to the board of The Power-Gas Corporation Ltd. in 1944. Mr. Hargreaves joined the company in 1936, subsequently becoming works manager. He is also a director of Ashmore, Benson, Pease & Co. Ltd.

SIR WILLIAM PENNEY, director of the Atomic Weapons Research Establishment, has been elected to the honorary fellowship of the Imperial College of Science & Technology. Sir William is a member of the governing body and a former student of the college.

MR. GEORGE S. WOOLLEY, chairman of James Woolley Sons & Co., manufacturing chemists of Manchester, has assumed the managing directorship of the company on the retirement for health reasons of COLONEL STANLEY WATSON. Colonel Watson will remain on the board.

MR. GEORGE E. NIXON, who has been selling African Pyrethrum in the US for many years on behalf of the Pyrethrum Boards of Kenya and Tanganyika and of the Societe Cooperative des Produits Agricoles in the Belgian Congo, arrived in London this week to discuss recent technical and commercial developments which indicate that a substantial increase in demand for this insecticide may be expected. Mr. Nixon is president of the Greene Trading Co., a New York subsidiary of Mitchell Cotts & Co. Ltd., London, who are the overseas agents of all three groups producing African Pyrethrum.

SIR JOHN COCKROFT, K.C.B., C.B.E., M.A., Ph.D., M.Sc., D.Sc., Hon. LL.D., F.R.S., M.I.E.E., director of the Atomic Energy Research Establishment, Harwell, Berks, left London by air on 21 April for a conference in Washington with US and Canadian scientists to review classification of atomic research information.

Obituary

DR. HARRY DEUEL, Professor of Biochemistry and Dean of the Graduate School of the University of Southern California, who had been teaching in London as a Fulbright Fellow until he was taken ill last month, died on 17 April at Pasadena, aged 58. He was internationally known for his work on the fatty acids, cholesterol, and vitamins. Born at St. Paul, Minnesota, in 1897 he was educated at Carleton College and Yale University. He was an instructor in the department of physiology in the medical school of Cornell University from 1923 to 1927. He had been professor of biochemistry in the University of Southern California since 1929 and dean since 1949.

The death is announced of MR. JAMES MONTGOMERY, a director of the Clyde Alloy Steel Co. Ltd., Motherwell. Mr. Montgomery was a member of the youth group education and training committee and the British Iron & Steel Federation (Scottish Area) training committee.

MR. VERNON YOUNG, F.C.I.S., a director of International Combustion (Holdings) Ltd., and chairman of three subsidiaries died after a short illness on 18 April at the age of 64. Mr. Young joined the organization in 1924 as secretary, a position he held until he resigned for health reasons shortly before his death. He was appointed a director of International Combustion (Holdings) Ltd. in 1952 and chairman of International Combustion Ltd. and International Combustion Products Ltd. in 1955.

Austrian Scholarships

FOR the first time in Austria scholarships sponsored by a private firm have been established. The first two, each worth £430, were awarded at the end of last year. They are intended to enable students to study chemistry, or some allied technical subject, for a period of six years at an Austrian university. Instituted by Shell Austria AG, two further scholarships will be awarded each year so that, from 1960 onwards, there will always be 12 Shell students studying at Austrian universities.

Selection of the winners is to be made by Shell in close collaboration with the Austrian Ministry of Education. Among the requirements leading to the choice of these students are exceptionally good progress at their secondary schools and a lack of any other means of enabling them to go to a university. Continued payment of the annual stipends, amounting to about £70 a year each, is to depend on satisfactory reports of the students' work. No obligation is placed on the winners of these scholarships to join Shell at the end of their courses.

It is hoped that the scholarships will make a contribution towards building up a pool of well educated young scientists, of whom there is a serious shortage in Austria.

Speaking of these awards Dr. Vogelsang, Under-Secretary to the Austrian Ministry of Education, has said that this action on Shell's part represented the first occasion in Austria when the real principle of the furtherance of study by parties other than the State had emerged. The State alone could not possibly undertake all that was necessary in the field of education. It urgently needed the assistance of industry.

Hercules Powder Co. Chosen

THE Hercules Powder Co. is one of two firms chosen to carry out the design and development of the third and final stage rocket engine for 'Project Vanguard'—the earth satellite programme. Allegany Ballistics Laboratory, near Cumberland, Maryland, operated by Hercules Powder Co. for the Navy, and the Grand Central Rocket Co. Redlands, California, were announced as participants in the earth satellite project by the US Navy, and The Glenn L. Martin Co. the prime contractor for 'Project Vanguard'.

Design details for this third stage rock t have not been disclosed beyond the fact that it will be a new, solid-propellant rocket. It was at Allegany Ballistics Laboratory that Hercules designed and developed booster rockets for the 'Nike' and the 'Terrier' guided anti-aircraft missiles and the 'Honest John' free-flight, ground-to-ground artillery rocket. It had earlier been disclosed that the earth satellite will be launched in numbers as part of the US programme for participation in the International Geophysical Year (1957).

Counting on three stages of propulsion, the first two stages will use liquid propellants. A solid-propellant rocket was chosen for the third stage because of its simplicity. Such a rocket consists essentially of a combustible charge in a container, an igniter, and a nozzle for the escape of the gases. Liquid-fuel rockets were chosen for the first and second stages because it is easier to guide that type of rocket.

SCI Annual Meeting

THE 75th annual meeting of the Society of Chemical Industry will be held in London from 9 to 15 July. Sir Charles and Lady Dodds will hold a reception at Guildhall on the evening of 9 July. The annual general meeting will be held on Tuesday, 10 July, and the annual dinner on 11 July.

During the meeting a number of factories and research organizations in the London area will be visited including the Paint Research Station at Teddington, the National Institute for Medical Research, the Central Electricity Authority (Bankside Generating Station), Glaxo Laboratories, the Isle of Grain refinery of Shell-Mex & BP, and the Atomic Energy Research Establishment at Harwell.

Shale Oil Output Stops

SCOTTISH Oils Ltd. is to stop production of shale oil at Addiewell Works, Bathgate Acid Works, and Burngrange Pit, West Calder. This follows the recent closing by the company of the Roman Camp Works, near Broxburn, and its supplying mines.

The contraction of the century-old Scottish shale oil industry is attributed to the growing competition from petroleum. From 3,250,000 tons in 1913, production has dropped to 1,200,000 tons.

British Chemical Prices

(These prices are checked with the manufacturers, but it must be pointed out that in many cases there are variations according to quantity, quality, place of delivery, etc.)

LONDON.—The demand for industrial chemicals continues along steady lines, and good quantities are being taken up against contracts. The movement of fertilizers continues to be brisk and the supply position has been reasonably good. There has been a steady flow of new bookings on home account. With the exception of the non-ferrous metal compounds the price position shows little change. As reported last week, lead oxides and white lead have been reduced in sympathy with the metal, and the quotation for copper sulphate was reduced on 18 April to £114 15s per ton fob less 2 per cent. Active conditions prevail in the coal tar products market with an improving demand for cresylic acid on home account and for export.

MANCHESTER.—Leading industrial users of heavy chemicals in Lancashire and the West Riding are mostly calling for steady deliveries of a wide range of products against contracts and traders on the Manchester market during the past week have dealt with a fair number of fresh enquiries from home users as well as for shipment. With the exception of some of the non-ferrous metal compounds, which are easier, the general price position remains firm. A steady movement of supplies of sulphate of ammonia and other fertilizers continues, and there has been little slackening in the demand for the tar products.

GLASGOW.—Conditions generally have been rather quieter in the Scottish heavy chemical market, although towards the latter part of the week an improved position was apparent. Prices have shown little or no change, but it was noted that copper sulphate has again shown a fall in price. On the agricultural side the demand continues. There is still a fair volume of export enquiries being received, and the market has remained fairly active.

General Chemicals

Acetic Acid.—Per ton : 80% technical, 10 tons, £83 ; 80% pure, 10 tons, £89 ; commercial glacial, 10 tons, £91 ; delivered buyers' premises in returnable barrels (technical acid barrels free) ; in glass carboys, £7 ; demijohns, £11 extra.

Acetic Anhydride.—Ton lots d/d, £123 per ton.

Alum.—Ground, about £25 per ton, f.o.r. MANCHESTER : Ground, £25.

Aluminium Sulphate.—Ex works, £14 15s per ton d/d. MANCHESTER : £14 10s to £17 15s.

Ammonia, Anhydrous.—1s 9d to 2s 3d per lb.

Ammonium Bicarbonate.—2-cwt. non-returnable drums, 1-cwt. non-returnable kegs ; 1-ton lots, £50 5s per ton.

Ammonium Chloride.—Per ton lot, in non-returnable packaging, £27 17s 6d.

Ammonium Nitrate.—D/d, £31 per ton (in 4-ton lots).

Ammonium Persulphate. — MANCHESTER : £6 2s 6d per cwt., in 1-cwt. lots, delivered. £112 10s per ton, in minimum 1-ton lots, delivered.

Ammonium Phosphate.—Mono- and di-, ton lots, d/d, £101 and £97 10s per ton.

Antimony Sulphide.—Crimson, 4s 4d to 4s 9½d ; golden, 2s 7½d to 4s 0½d ; all per lb., delivered UK in minimum 1-ton lots.

Arsenic.—Per ton, £45 to £50 ex store.

Barium Carbonate.—Precip., d/d ; 4-ton lots, £41 per ton ; 2-ton lots, £41 10s per ton, bag packing.

Barium Chloride.—£42 15s per ton in 2-ton lots.

Barium Sulphate (Dry Blanc Fixe).—Precip., 4-ton lots, £42 10s per ton d/d ; 2-ton lots, £43 per ton d/d.

Bleaching Powder.—£28 12 6d per ton in returnable casks, carriage paid station, in 4-ton lots.

Borax.—Per ton for ton lots, in hessian sacks, carriage paid : Technical, anhydrous, £61 10s ; granular, £41 ; crystal, £43 10s ; powder, £44 10s ; extra fine powder, £45 10s ; BP, granular, £50 ; crystal, £52 10s ; powder, £53 10s ; extra fine powder, £54 10s.

Boric Acid.—Per ton for ton lots, in hessian sacks, carriage paid : Technical, granular, £70 ; crystal, £78 ; powder, £75 10s ; extra fine powder, £77 10s ; BP granular, £83 ; crystal, £90 ; powder, £87 10s ; extra fine powder, £89 10s.

Calcium Chloride.—Per ton lots, in non-returnable packaging : solid, £15 ; flake, £16.

Chlorine, Liquid.—£37 10s per ton, in returnable 16-17-cwt. drums, delivered address in 3-drum lots.

Chromic Acid.—2s 0¾d per lb., less 2½%, d/d UK, in 1-ton lots.

Chromium Sulphate, Basic.—Crystals, 7¾d per lb. delivered (£73 10s per ton).

Citric Acid.—1-cwt. lots, £10 5s cwt.

Cobalt Oxide.—Black, delivered, bulk quantities, 13s 2d per lb.

Copper Carbonate.—3s 3d per lb.

Copper Sulphate.—£114 15s per ton f.o.b., less 2% in 2-cwt. bags.

Cream of Tartar.—100%, per cwt., about £11 12s.

Formaldehyde.—£37 5s per ton in casks, d/d.

Formic Acid.—85%, £86 10s in 4-ton lots, carriage paid.

Glycerine.—Chemically pure, double distilled 1.260 S.G., £12 9s 0d per cwt. Refined pale straw industrial, 5s per cwt. less than chemically pure.

Hydrochloric Acid.—Spot, about 12s per carboy d/d, according to purity, strength and locality.

Hydrofluoric Acid.—59/60%, about 1s 6d per lb.

Hydrogen Peroxide.—27.5% wt., £128 10s per ton. 35% wt., £158 per ton d/d. Carboys extra and returnable.

Iodine.—Resublimed B.P., 17s 7d per lb., in 28-lb. lots.

Iodoform.—£1 6s 7d per lb., in 28-lb. lots.

Lactic Acid.—Pale tech., 44 per cent by weight, 14d per lb. ; dark tech., 44 per cent by weight, 9d per lb., ex-works ; chemical quality, 44 per cent by weight, 12¼d per lb., ex-works ; 1-ton lots, usual container terms.

Lead Acetate.—White : About £150 per ton.

Lead Nitrate.—About £135 1-ton lots.

Lead, Red.—Basis prices per ton. Genuine dry red, £142 15s ; orange lead, £154 15s. Ground in oil : red, £167 5s ; orange, £174 5s.

Lead, White.—Basis prices : Dry English in 5-cwt. casks £147 15s per ton. Ground in oil : English, 1-cwt. lots 194s per cwt.

Lime Acetate.—Brown, ton lots, d/d, £40 per ton ; grey, 80-82%, ton lots, d/d, £45 per ton.

Litharge.—£144 15s per ton, in 5-ton lots.

Magnesite.—Calcined, in bags, ex-works, about £21 per ton.

Magnesium Carbonate.—Light, commercial, d/d, 2-ton lots, £84 10s per ton, under 2 tons, £92 per ton.

Magnesium Chloride.—Solid (ex-wharf), £16 per ton.

Magnesium Oxide.—Light, commercial, d/d, under 1-ton lots, £245 per ton.

Magnesium Sulphate.—Crystals, £16 per ton.

Mercuric Chloride.—Technical Powder, £1 3s 6d per lb., in 5-cwt. lots ; smaller quantities dearer.

Mercury Sulphide, Red.—£1 9s 3d per lb., for 5-cwt. lots.

Nickel Sulphate.—D/d, buyers UK £170 per ton. Nominal.

Nitric Acid.—80° Tw., £35 per ton.

Oxalic Acid.—Home manufacture, minimum 4-ton lots, in 5-cwt. casks, about £130 per ton, carriage paid.

Phosphoric Acid.—Technical (S.G. 1.700) ton lots, carriage paid, £92 per ton ; B.P. (S.G. 1.750), ton lots, carriage paid, 1s 3½d per lb.

Potash, Caustic.—Solid, £93 10s per ton for 1-ton lots ; Liquid, £36 5s.

Potassium Carbonate.—Calcined, 96/98%, about £74 10s per ton for 1-ton lots, ex-store.

Potassium Chloride.—Industrial, 96%, 1-ton lots, about £24 per ton.

Potassium Dichromate.—Crystals and granular, 1s 1d per lb., in 5-cwt. to 1-ton lots, d/d UK.

Potassium Iodide.—B.P., 14s 1d per lb. in 28-lb. lots ; 13s 7d in cwt. lots.

Potassium Nitrate.—In 4-ton lots, in non-returnable packaging, paid address, £63 10s per ton.

Potassium Permanganate.—BP, 1-cwt. lots, 1s 9d per lb. ; 3-cwt. lots, 1s 8½d per lb. ; 5-cwt. lots, 1s 8d per lb. ; 1-ton lots, 1s 7¾d per lb. ; 5-ton lots, 1s 7½d per lb. ; Tech., 5-cwt. packed in 1-cwt. drums, £8 14s 6d per cwt. ; packed in 1 drum, £8 9s. 6d per cwt.

Salammoniac.—Per ton lot, in non-returnable packaging, £45 10s.

Salicylic Acid.—MANCHESTER : Technical 2s 8½d per lb. d/d.

Soda Ash.—58% ex-depot or d/d, London station, about £15 5s 6d per ton, 1-ton lots.

Soda, Caustic.—Solid 76/77% ; spot, £30 to £32 per ton d/d (4 ton lots).

Sodium Acetate.—Commercial crystals, £91 per ton d/d.

Sodium Bicarbonate.—Per ton lot, in non-returnable packaging, £15 10s.

Sodium Bisulphite. — Powder, 60/62%, £42 15s d/d in 2-ton lots for home trade.

Sodium Carbonate Monohydrate.—Per ton lot, in non-returnable packaging, paid address, £59 5s.

Sodium Chlorate.—About £80 per ton in 1-cwt. drums, carriage paid station, in 4-ton lots.

Sodium Cyanide.—96/98%, £113 5s per ton lot in 1-cwt. drums.

Sodium Dichromate.—Crystals, cake and powder, 10¾d per lb. Net d/d UK, anhydrous, 1s 0½d per lb. Net del. d/d UK, 5-cwt. to 1-ton lots.

Sodium Fluoride.—Delivered, 1-ton lots and over, £5 per cwt. ; 1-cwt. lots, £5 10s per cwt.

Sodium Hyposulphite.—Pea crystals £35 15s a ton ; commercial, 1-ton lots, £32 10s per ton, carriage paid.

Sodium Iodide.—BP, 17s 1d per lb. in 28-lb. lots.

Sodium Metaphosphate (Calgon).—Flaked, loose in metal drums, £133 per ton.

Sodium Metasilicate.—£25 per ton, d/d UK in ton lots, loaned bags.

Sodium Nitrate.—Chilean refined granulated over 98% 6-ton lots, d/d station, £28 10s.

Sodium Nitrite.—£32 per ton (4-ton lots).

Sodium Percarbonate.—12½% available oxygen, £8 6s 9d per cwt. in 1-cwt. kegs.

Sodium Phosphate.—Per ton d/d for ton lots : Di-sodium, crystalline, £38 10s, anhydrous, £84 ; tri-sodium, crystalline, £39 10s, anhydrous, £82.

Sodium Silicate.—75-84° Tw. Lancashire and Cheshire, 4-ton lots, d/d station in loaned drums, £10 15s per ton ; Dorset, Somerset and Devon, £3 17s 6d per ton extra ; Scotland and S. Wales, £3 per ton extra. Elsewhere in England, excluding Cornwall, and Wales, £1 12s 6d per ton extra.

Sodium Sulphate (Desiccated Glauber's Salts).—d/d in bags ton, £18.

Sodium Sulphate (Glauber's Salt).—£9 5s to £10 5s per ton d/d.

Sodium Sulphate (Salt Cake).—Unground. £6 per ton d/d station in bulk. MANCHESTER : £6 10s per ton d/d station.

Sodium Sulphide.—Solid, 60/62%, spot, £33 2s 6d per ton, d/d, in drums in 1-ton lots ; broken, £34 2s 6d per ton, d/d, in drums in 1-ton lots.

Sodium Sulphite.—Anhydrous, £66 5s per ton ; commercial, £25 5s to £27 per ton d/d station in bags.

Sulphur.—Per ton for 4 tons or more, ground, £20 to £22, according to fineness.

Sulphuric Acid.—Net, naked at works, 168° Tw. according to quality, per ton, £10 7s 6d to £12 ; 140° Tw., arsenic free, per ton, £8 12s 6d ; 140° Tw., arsenious, per ton, £8 4s 6d.

Tartaric Acid.—Per cwt. : 10 cwt. or more £13 10s, one cwt. £13 15s.

Titanium Oxide.—Standard grade comm., with rutile structure, £172 per ton ; standard grade comm., £152 per ton.

Zinc Oxide.—Maximum price per ton for 2-ton lots, d/d, white seal, £119 ; green seal, £117 ; red seal, 2-ton lots, £114 per ton.

Solvents & Plasticizers

Acetone.—Small lots : In 5-gal. cans : 5-gal., £125, 10-gal. and upward, £115, cans included. In 40/45 gal. returnable drums, spot : Less than 1 ton, £90 ; 1 to less than 5 tons, £87 ; 5 to less than 10 tons, £86 ; 10 tons and upward, £85. In tank wagons, spot : 1 to less than 5 tons (min. 400 gal.), £85 ; 5 to less than 10 tons (1,500 gal.), £84 ; 10 tons and upward (2,500 gal.), £83 ; contract rebate, £2. All per ton d/d.

Butyl Acetate BSS.—£159 per ton, in 10-ton lots.

***n*-Butyl alcohol, BSS.**—10 tons, in drums, £143 per ton d/d.

***sec*-Butyl Alcohol.**—5 gal. drums £159 ; 40 gal. drums : less than 1 ton £124 per ton ; 1 to 10 tons £123 per ton ; 10 tons and over £119 per ton ; 100 tons and over £120 per ton.

***tert*-Butyl Alcohol.**—5-gal. drums £195 10s per ton ; 40/45 gal. drums : less than 1 ton £175 10s per ton ; 1 to 5 tons £174 10s per ton ; 5 to 10 tons, £173 10s ; 10 tons and over £172 10s.

Diacetone Alcohol.—Small lots : 5 gal. drums, £177 per ton ; 10 gal. drums, £167 per ton. In 40/45 gal. drums ; less than 1 ton, £142 per ton ; 1 to 9 tons, £141 per ton ; 10 to 50 tons, £140 per ton ; 50 to 100 tons, £139 per ton ; 100 tons and over, £138 per ton.

Dibutyl Phthalate.—In drums, 10 tons, 2s per lb. d/d ; 45-gal. drums, 2s 1½d per lb. d/d.

Diethyl Phthalate.—In drums, 10 tons, 1s 11½d per lb. d/d ; 45 gal. drums, 2s 1d per lb. d/d.

Dimethyl Phthalate.—In drums, 10 tons, 1s 9d per lb. d/d ; 45 gal. drums, 1s 10½d per lb. d/d.

Dioctyl Phthalate.—In drums, 10 tons, 2s 8d per lb. d/d ; 45 gal. drums, 2s 9½d per lb. d/d.

Ether BSS.—In 1 ton lots, 1s 11d per lb. ; drums extra.

Ethyl Acetate.—10 tons lots, d/d, £128 per ton.

Ethyl Alcohol (PBS 66 o.p.).—Over 300,000 p. gal., 2s 9d ; 2,500-10,000 p. gal., 2s 11½d per p. gal., d/d in tankers. D/D in 40/45-gal. drums, 1d p.p.g. extra. Absolute alcohol (75.2 o.p.) 5d p.p.g. extra.

Methanol.—Pure synthetic, d/d, £43 15s per ton.

Methylated Spirit.—Industrial 66° o.p. : 500 gal. and over in tankers, 4s 10d per gal. d/d ; 100-499 gal. in drums, 5s 2½d per gal. d/d. Pyridinised 64 o.p. : 500 gal. and over in tankers, 5s 0d per gal. d/d ; 100-499 gal. in drums, 5s 4½d per gal. d/d.

Methyl Ethyl Ketone.—10-ton lots, £133 per ton d/d ; 100-ton lots, £131 per ton d/d.

Methyl *iso*Butyl Ketone.—10 tons and over £159 per ton.

***iso*Propyl Acetate.**—In drums, 10 tons, £123 per ton d/d ; 45 gal. drums, £129 per ton d/d.

***iso*Propyl Alcohol.**—Small lots: 5-gal. drums, £118 per ton ; 10-gal. drums, £108 per ton ; in 40-45 gal. drums ; less than 1 ton, £83 per ton ; 1 to 9 tons £81 per ton ; 10 to 50 tons, £80 10s per ton ; 50 tons and over, £80 per ton.

Rubber Chemicals

Carbon Bisulphide.—£61 to £67 per ton, according to quality.

Carbon Black.—8d to 1s per lb., according to packing.

Carbon Tetrachloride.—Ton lots, £79 10s per ton.

India-Rubber Substitutes.—White, 1s 5¾d to 1s 9½d per lb. ; dark, 1s 4d to 1s 6¾d per lb. delivered free to customers' works.

Lithopone.—30%, about £55 per ton.

Mineral Black.—£7 10s to £10 per ton.

Sulphur Chloride.—British, about £50 per ton.

Vegetable Lamp Black.—£64 8s per ton in 2-ton lots.

Vermilion.—Pale or deep, 15s 6d per lb. for 7-lb. lots.

Coal-Tar Products

Benzole.—Per gal., minimum of 200 gals. delivered in bulk, 90's, 5s ; pure, 5s 4d.

Carbolic Acid.—Crystals, minimum price 1s 4d to 1s 7d per lb. delivered in bulk, ¼d per lb. extra in 40/50 gal. returnable drums. Crude, 60's, 8s per gal. Manchester : Crystals, 1s 4d to 1s 7d per lb., d/d crude, 8s naked, at works.

Creosote.— Home trade, 1s to 1s 9d per gal. according to quality, f.o.r. maker's works. MANCHESTER : 1s to 1s 8d per gal.

Cresylic Acid.—Pale 99/100%, 6s 4d per gal. ; 99.5/100%, 6s 6d per gal. D/d UK in bulk : Pale A.D.F. from 6s 5d per imperial gallon f.o.b. UK, 95 cents per US gallon, c.i.f. NY.

Naphtha.—Solvent, 90/160°, 5s per gal ; heavy, 90/190°, 3s 11d per gal. for bulk 1000-gal. lots, d/d. Drums extra ; higher prices for smaller lots.

Naphthalene.—Crude, 4-ton lots, in buyers' bags, £18 1s 6d to £29 12s per ton nominal, according to m.p. ; hot pressed, £41 10s 6d per ton in bulk ex-works ; refined crystals, £60 10s per ton d/d min. 4-ton lots.

Pitch.—Medium, soft, home trade, £9 per ton f.o.r. suppliers' works ; export trade about £10 10s per ton f.o.b. suppliers' port.

Pyridine.—90/160, 20/- to £1 2s 6d per gal.

Toluole.—Pure, 5s 9d ; 90's 5s 0d per gal. d/d. 1000 gal. lots in bulk. MANCHESTER : Pure, 5s 9d per gal. naked.

Xylole.—5s 10d to 6s 3½d per gal., according to grade, in 1000 gal. lots d/d London area in bulk.

Intermediates & Dyes
(Prices Nominal)

***m*-Cresol 98/100%.**—4s 9d per lb. d/d.

***o*-Cresol 30/31° C.**—1s per lb. d/d.

***p*-Cresol 34/35° C.**—4s 9d per lb. d/d.

Dichloraniline.—4s 3½d per lb.

Dinitrobenzene.—88/99° C., 2s per lb.

Dinitrotoluene.— S.P. 15° C., 2s 0½d per lb. ; S.P. 26° C., 1s 4d per lb. ; S.P. 33° C., 1s 2d per lb. ; S.P. 66/68° C., 1s 10d per lb. Drums extra.

***p*-Nitraniline.**—4s 10d per lb.

Nitrobenzene.—Spot, 10d per lb. in 90-gal. drums, drums extra, 1-ton lots d/d buyers' works.

Nitronaphthalene.—2s 4d per lb.

***o*-Toluidine.**—1s 10d per lb., in 8/10-cwt. drums, drums extra.

***p*-Toluidine.**—5s 9½d per lb., in casks.

Dimethylaniline.—3s 3d per lb., drums extra, carriage paid.

Chemical & Allied Stocks & Shares

CHEMICAL shares have participated in the strong upswing in stock markets which followed the Budget. The City was relieved that the Chancellor had not imposed any big increase in taxation, such as a rise in the standard rate of income tax. On the other hand, it is realized that, looking ahead, higher taxation might become necessary to check inflation if the boost planned for national savings does not meet with big success in absorbing additional spending power arising from wage increases.

The general deduction from the Budget is that the Chancellor feels very hopeful that the better trend in our gold and dollar reserves, and in our trade figures, should continue. In the circumstances, it is hardly surprising that stock markets have become more cheerful, and that buyers who had been keeping out of markets until after the Budget have reappeared. In fact, despite the higher profit tax, the general belief is that there are good propects of dividends being maintained. The prevailing view is that a fair number of increases may be in prospect, though it is realized that decisions will depend on the position of individual companies, not only in regard to the trading outlook, but also in regard to bank loans and the credit squeeze.

Results of chemical and kindred companies which have been issued in the past few weeks have created a good impression. Although costs have risen and competition has been much keener both at home and in overseas markets, many companies appear to have been successful in increasing output and turnover.

Imperial Chemicals Up

Compared with a month ago, Imperial Chemical have moved up from 44s 1½d to 49s 6d in accordance with the prevailing market trend. The city has been awaiting with particular interest the ICI dividend announcement which will have been made by the time these notes are in print. Dividend last year was 10 per cent.

Although 'ex' the dividend, Albright & Wilson 5s shares at 21s 1½d were 1s 6d higher on balance. Moreover, Hickson & Welch 10s shares have strengthened from 28s 6d to 29s. Hardman & Holden 5s shares moved up from 10s 6d to 11s, while after the reaction which reflected some disappointment with the absence of a higher dividend. Monsanto Chemical 5s shares have risen to 29s 6d, a gain of 5s 3d compared with a month ago. In other directions, Yorkshire Dyeware & Chemical 5s shares gained a few pence at 10s, while Reichhold Chemical 5s shares were 19s 4½d, compared with 19s.

Anchor Chemicals Eased

Anchor Chemical 5s shares have eased from 13s 6d to 13s. Fisons advanced on the month from 50s 6d to 55s 3d, but the biggest rise of all has been in Borax Consolidated, which were at the new high record of 201s 10½d, compared with 176s 3d a month ago. These shares have been in steady demand, partly owing to US buying it is said in the City. The assumption prevails that the enquiry into the group's structure, to which the chairman referred in his annual statement, may result in a special distribution of some kind for shareholders.

Lawes Chemical 10s shares have moved up from 15s to 15s 7½d while among other shares, Coalite & Chemical 2s shares firmed up to 3s 9d. British Glues 4s shares were good too, having risen on the month from 9s to 11s. Helped by the financial results, Brotherton 10s shares were 35s xd, as against 32s 3d a month ago. Moreover, F. W. Berk 5s shares strengthened from 7s 9d to 8s 3d.

Among plastics, British Xylonite were 36s 9d, a gain of 1s 3d on balance, and British Industrial Plastics 2s shares moved slightly higher at 6s. Ashe Chemical 1s shares rose from 1s 4½d to 1s 7½d and British Chrome Chemicals 5s shares held steady at 11s 6d.

In other directions Triplex Glass, also moved higher with the general trend of markets, and were 40s 3d, a gain of 9d on the month. Boots Drug 5s units at 18s were 2s higher than a month ago. The 4s units of The Distillers Co. advanced from 22s 10½d to 24s 4½d and United Molasses from 36s to 40s 6d while Unilever were 78s 9d compared with 75s 3d a month ago. The higher Shell dividend and free scrip issue plan and record results put outstanding strength into oils. Shell were 159s 6d compared with 143s 9d a month ago, while BP have soared from 102s 6d a month ago to the new record level of 141s 1½d.

Commercial Intelligence

The following are taken from the printed reports, but we cannot be responsible for errors that may occur.

Mortgages & Charges

(Note.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described herein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every company shall, in making its Annual Summary, specify the total amount of debt due from the company in respect of all Mortgages or Charges. The following Mortgages or Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary but such total may have been reduced.)

MARTIN'S RUBBER CO., LTD., Southampton.—16 March, three mortgages, to National Provincial Bank Ltd. each securing all moneys due or to become due to the bank; respectively charged on sites of 15 & 16 Brunswick Square & 28/33 Orchard Place, all Southampton, with fixtures etc. *Nil. 5 July, 1955.

RUSSELL LAMBERT LTD., Hull, metal and other box manufacturers.—20 March, mortgage, to District Bank Ltd. securing all moneys due or to become due to the bank; charged on land & factory & cotts. 390 & 392 Stoneferry Road & Rose-cot., all Stoneferry, Hull. *£1,000. 31 December, 1952.

SCIENTIFIC INSTRUMENT & MODEL CO. LTD. Ross-on-Wye.—16 March, mortgage & charge, to National Provincial Bank Ltd. securing all moneys due or to become due to the bank; charged on The Link, Weston-under-Penyard, & factory & land Brampton Road, Ross-on-Wye, with plant, machinery, fixtures etc. & a general charge. *£6,000. 14 January, 1956.

Satisfaction

HULL CHEMICAL WORKS LTD.—Satisfaction 12 March, of debs. reg. 24 July, 1931.

Company News

Telegraph Construction & Maintenance

Group profit of the Telegraph Construction & Maintenance Co. Ltd. for the year ended 31 December, 1955, amounted, before taxation, to £536,530, compared with £360,505 for the previous year. Group profit after taxation was £252,375 against £193,928. The directors recommend a final dividend on the ordinary shares of 3¼ per cent, less income tax, plus a cash bonus of 1 per cent, less income tax. The company's annual general meeting will be held at Winchester House, Old Broad Street, London EC2, at noon on 3 May.

Shawinigan Water & Power Co.

The directors have declared a dividend of 45 cents a share on the no par value common shares for the quarter ending 31 March, 1956, payable 25 May to shareholders of record 13 April.

P. B. Cow & Co. Ltd.

Group trading profit of P. B. Cow & Co. Ltd., rubber and plastics manufacturers, in 1955 decreased from £750,341 to £639,165. The ordinary dividend is maintained at 25 per cent. Group fixed assets increased from £1,174,042 to £1,240,595 and net assets increased from £2,135,672 to £2,299,234.

Rockware Glass

Group profit of Rockware Glass for 1955 amounted, before tax, to £788,821, compared with £643,105 for 1954. Net profit was £253,143, against £194,966 for the previous year. The directors recommend a final dividend of 12½ per cent, to make 20 per cent on £700,000 Ordinary, as doubled by a scrip issue.

Reichhold Chemicals

A group taxed profit of £170,877 after tax of £164,925 has been made by Reichhold Chemicals. A final dividend of 10 per cent and a bonus of five per cent, making a total of 22½ per cent on the £469,401 ordinary, has been recommended. This distribution is in all respects the same as that for 1954. Profit for 1954 was, however, £183,782 after £187,198 tax.

Canadian Industries Ltd.

Consolidated net income of Canadian Industries Ltd. and subsidiary companies for the year ended 31 December 1955 amounted to $6,546,000 according to the company's annual report recently issued. Although no comparison of earnings with the full 1954 is available, the report discloses that consolidated income from operations for the last six months of 1955 was 27 per cent above that for the same period of 1954. Consolidated sales to customers at $118,800,000 were up $13,700,000. After preferred dividends, earnings were equal to 73 cents a common share and dividends totalling 50 cents a share were declared for the year.

Publications & Announcements

'FLUOROCARBON Derivatives' by R. N. Haszeldine, No. 1 in the 1956 series of lectures, monographs and reports of The Royal Institute of Chemistry, has been published from 30 Russell Square, London WC1. After reviewing briefly the history of fluorine chemistry the author goes on to discuss some of the earlier methods of making organic fluorine compounds. The fluorocarbons can be regarded as the parent compounds of a new branch of chemistry, just as the hydrocarbons are the parent compounds of our more familiar and advanced organic chemistry says Dr. Haszeldine. Chains of—CF_2—groups are stable, unlike chains of—CCl_2—groups, and fluorocarbons can be manipulated by the conventional techniques of organic chemistry. The first group of compounds to be discussed in detail is the fluorocarbon iodides. This is followed by a brief account of the reactions and syntheses possible with these compounds. This monograph, which is based on the Meldola Lecture given by Dr. Haszeldine at Imperial College on 9 November 1954, then goes on to review the whole field of fluorocarbon chemistry.

* * *

ACCESSORIES for microscopy and biological science are comprehensively detailed in a revised booklet published by George T. Gurr Ltd., of New King's Road, London SW6. Included with the booklet is a four-page supplement on current laboratory methods.

* * *

A SIMPLE explanation of automation is given in a small booklet, 'Flow Production and Automation', by Frank G. Woollard, M.B.E., M.I.Mech.E., M.I.Prod.E., published recently by the Industrial Administration Group of the Guild of Students of the College of Technology, Birmingham. The booklet emphasizes that automation is the next step forward from flow production methods of organizing production work, and summarizes 18 axioms for successful working which apply equally to both systems. The last of these axioms is that 'The system must benefit everyone: consumers, workers and owners'. It goes on: 'Unless this 18th principle is satisfied the system cannot reach full stature and, if it does not, the equipment will not be used economically. This principle of "benefit for all" is not based on altruism but on the hard facts of business efficiency. Benefit to the consumer is essential in order to maintain that constant demand which is essential for factories working on the flow-line principle. This condition can be achieved only by supplying the required articles at attractive prices. The benefit to the workers—who as consumers will benefit from lower prices—will arise from shorter hours, better conditions, lighter tasks and increased pay packets, for, make no mistake, it was the mass and flow establishments that led the way in these directions. The owners must also receive some benefit because it is they who provide the management and the machinery for operating the flow-production system.' Copies of the booklet, price 5s, are obtainable from the Industrial Administration Group, c/o College of Technology, Gosta Green, Birmingham 4.

Next Week's Events

TUESDAY 1 MAY

Institute of Metal Finishing

Birmingham: James Watt Memorial Institute, Great Charles Street, 6.30 p.m. 'Works Instrumentation & Automatic Control' by W. F. B. Baker, A.M.I.E.E.; and 'Laboratory Instruments & Techniques' by G. L. Bailey, Ph.D., D.I.C., F.Inst.P.

WEDNESDAY 2 MAY

SCI (Dublin)

Dublin: University College, 7.45 p.m. Joint meeting with the RIC and ICI Ltd. 'Seaweeds & Their Utilization' by F. N. Woodward, B.Sc., Ph.D., F.R.S.E.

The Society for Analytical Chemistry

London: Meeting Room of The Chemical Society, Burlington House, Piccadilly W1, 7 p.m. 'The Composition of Some Deposits & Muds in Estuaries, Rivers & Lakes' by J. H. Hamence, M.Sc., Ph.D., F.R.I.C.

Institute of Metal Finishing

Glasgow: 39 Elmbank Crescent, 6.30 p.m. Annual general meeting.

THURSDAY 3 MAY

The Chemical Society

London: Rooms of The Society, Burlington House, Piccadilly W1, 7.30 p.m. Meeting for the reading of original papers.

Exeter: Washington Singer Laboratories, 5 p.m. 'Surface Diffusion' by Professor R. M. Barrer, D.Sc., F.R.I.C.

Institute of Metal Finishing

Manchester: Engineers' Club, Albert Square, 7.30 p.m. Annual general meeting and platers' forum.

Institution of Chemical Engineers

London: The Royal Institution, Albemarle Street W1, 5.30 p.m. 'Some Problems in the Maintenance of Nuclear Reactors' by H. G. Davey, O.B.E.

FRIDAY 4 MAY

SCI (Dublin)

Cork: University College, 7.45 p.m. Joint meeting with the RIC and I.C. Ltd. 'Seaweeds & Their Utilization' by F. N. Woodward, B.Sc., Ph.D., F.R.S.E.

Russian Scientist Lectures at Harwell

Mr. I. V. Kurchatov, the Russian atomic scientist who has been touring with the Russian leaders, gave a lecture to 350 British scientists at Harwell on Wednesday.

Activated Carbon From Peat

A FACTORY for the production of activated carbon from peat was opened on 24 April by Lord Glentoran, Minister of Commerce for the Northern Ireland Government. The enterprise represents the first production of activated carbons from peat in the UK, in which powdered decolorizing carbon will be produced by a new process utilizing a high temperature fluid bed technique.

The project has been engineered by The British Ceca Co. Ltd. of London, who will market the products of the factory which will be operated by a new company, Ceca (Northern Ireland) Ltd., in participation with Charles Tennant & Co. (Northern Ireland) Ltd. The project follows three years' survey by the Department of Industrial & Forensic Science of the Northern Ireland Government on peat deposits available as raw material.

The project is of particular interest as it will utilize a raw material which hitherto appeared to have little value. Activated carbon produced from peat has qualities which make it of special interest in certain branches of the chemical and food industries. Other applications are in process where activated decolorizing carbons are used for the removal of unwanted colour, taste or odour. Information regarding the product can be obtained from The British Ceca Co. Ltd., 175 Piccadilly, London W1.

New BS Glassware

SAMPLES of glass pipeline and fittings manufactured to the new British Standard 2598:1955 is being displayed by QVF Ltd. at the British Industries Fair, Olympia.

Mr. J. G. Window, sales director of QVF, said: 'Adoption of this standard is the result of four years' intensive research. The standard, with is for pipelines and fittings ranging from ¾ inch to 18 inches in diameter, incorporates the best features of the two existing ranges. Examples of glassware on our stand will demonstrate the ease with which the new material can be connected to existing ranges.'

Among material on show complying with the new standard will be 18 inch diameter flange glass pipeline and fittings—claimed to be the largest in the world—and an all-glass heat exchanger with a 60 square feet cooling surface, 18 inches in diameter.

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The engagement of persons answering these advertisement must be made through a Local Office of the Ministry o Labour or a Scheduled Employment Agency if the applicant is a man aged 18-64 inclusive, or a woman aged 18-59 inclusive, unless he or she, or the employment, is excepted from the provisions of the Notifications of Vacancies Order, 1952

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PATENTS

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